THE PLANT DISEASE REPORTER

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

IN THIS ISSUE

Check list revision, by Freeman Weiss, page - 68.

John R. Hardison sends a preliminary check list of grass diseases in Kentucky, page - 76.

W. W. Mackie and W. C. Snyder report occurrence of ergot on Dallis grass in California, page - 85.

R. E. Atkinson reports wheat mosaic, page - 86, and the occurrence of an apparently new mosaic chlorosis of oats, page - 86, both in North and South Carolina.

Diaporthe sojae has been observed on four different host plants in Georgia, according to E. S. Luttrell, page - 89.

Storage diseases of fruits and vegetables in New York this season are reported by Robert C. Cassell, page - 90.

P. W. Miller and F. P. McWhorter report results of onion smut control experiments in Oregon, page - 93.

Isolations of Verticillium from trees and shrubs in Illinois during the past five years are reported by J. C. Carter, page - 95.

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CHECK LIST REVISION

Freeman Weiss

DACTYLIS (GRAMINEAE)

DACTYLIS GLOMERATA L., ORCHARD GRASS. Coarse perennial occurring throughout N. America except the far North and Southwest, commonly grown in meadows and pastures for hay and forage; a variegated form also is grown in gardens.

Ascochyta graminicola Sacc., leaf spot. Del.
Claviceps microcephala (Wallr.) Tul., ergot. Conn., Ind., Okla., Alaska.
C. purpurea (Fr.) Tul., ergot. Widespread.
Colletotrichum graminicolum (Ces.) G. W. Wils., anthracnose. N. J. to N. Car., Ky. and Minn., Oreg.
Darluca filum (Biv-Bern.) Cast. on Uromyces dactylidis. Ky.
Epichloë typhina (Pers. ex Fr.) Tul., choke. N. J.
Erysiphe graminis DC., powdery mildew. Widespread.
Fusarium avenaceum (Fr.) Sacc., culm canker. Oreg.
F. culmorum (W.G. Sm.) Sacc., scab. W. Va.
F. poae (Pk.) Wr. (Sporotrichum poae Pk.), silver top. N. Y., Pa.
F. scirpi C. R. Lambert & Fautr. var. acuminatum (Ell. & Ev.) Wr., secondary root rot. N. Dak.
Helminthosporium sp., leaf spot. Mass., Minn., Pa., Wash.
H. sativum Pam. King & Bakke, root rot. N. Dak.
H. triseptatum Drechs., on fading leaves. N. Y.
Heterodera marioni (Cornu) Goodey, rootknot. Fla.
Leptosphaeria culmorum Auers., on dead culms. Calif., N. Y.
Mastigosporium rubricosum (Dearn. & Barth.) Sprague, purple spot. Oreg., Wash.
Phyllosticta owensii Sprague, on leaves. Oreg.
Puccinia coronata Cda. (II,III), crown rust. Iowa, Tenn., Wis.
P. graminis Pers. (II,III), stem rust. General. The vars. avenae Eriks. & Henn., tritici Eriks. & Henn., and phlei-pratensis (Eriks. & Henn.) Stakman & Piemeisel have been identified.
Rhynchosporium orthosporum Caldwell, scald. Oreg., Wis.
R. secalis (Oud.) J. J. Davis, scald. Calif., Oreg., Wis. Reported under this name, but perhaps the preceding sp.
Scolecotrichum graminis Fckl., brown stripe. General
Selenophoma donacis (Pass.) Sprague & A.G. Johns. var., stem speckle. Oreg., Wash.
Septoria sp., leaf spot. Kansas. Reported as S. graminum Desm., doubtful.
Stagonospora arenaria Sacc., leaf blotch. Iowa, Ky., Mich., Ohio, Oreg.
S. subseriata (Desm.) Sacc. var. maculata Grove, leaf spot. Pa.
Uromyces dactylidis Otth (II,III), leaf rust. Ky., Mass., N. Y., N. Car., Tenn., Va. O and I on Ranunculus repens L.
Ustilago striaeformis (West.) Niessl, stripe smut. Ky., Mass., N.Y., Oreg., Pa., Va., W. Va.
Wojnowicia graminis (McAlp.) Sacc. & D. Sacc., secondary root rot N. Dak.

Bends (hairpin) -- cause unknown. Ky., Mont., Utah, Wash.

DACTYLOCTENIUM (GRAMINEAE)

DACTYLOCTENIUM AEGYPTIUM (L.) Richt., CROWFOOT GRASS. Annual of Old World tropics, occurring in tropical America and the Gulf States, occasionally to Ill. and N. J., a weed in cultivated ground but useful to wildlife.

Cercospora tesselata Atk., leaf spot. Ala.
Ustilago sparsa Underw., head smut. Ala., La., S. Car.

DANTHONIA (GRAMINEAE)

DANTHONIA CALIFORNICA Boland, including the var. AMERICANA (Scribn.) Hitchc., CALIFORNIA OATGRASS (1). Perennial of open woods and meadows in the Rocky Mountain and Pacific Coast States; of minor forage value. D. INTERMEDIA Vasey, TIMBER O. (2), and D. PARRYI Scribn., PARRY O. (3), grow at higher altitudes in the same area.

Anguina sp., leaf or inflorescence gall. Calif., Tex.
Claviceps purpurea (Fr.) Tul., ergot. Colo. (3).
Helminthosporium cyclops Drechs., leaf spot. Oreg. (1).
Heterosporium avenae Oud., on leaves. Calif. (3).
Lophodermium arundinaceum (Schrad. ex Fr.) Chev., on old leaves. N. Mex. (2)
Phacoseptoria festucae Sprague, on leaves. Colo. (3)
Pleospora sp., leaf rot. Oreg., Wyo. (2)
P. infectoria Fckl., on leaves. N. Mex. (2)
Scolecotrichum graminis Fckl., brown stripe. Calif., Oreg. (1)
Selenophoma donacis (Pass.) Sprague & A. G. Johns. var., stem speckle, eye spot. Oreg. (1)
Ustilago residua Clint., panicle smut. Calif., Oreg. (1); Calif., Mont., Wyo. (2); Ky., Colo. (3)

Bends (hairpin) -- cause unknown. Ida. (1)

DANTHONIA COMPRESSA Austin, FLATSTEM OATGRASS (1), and D. SPICATA (L.) Beauv., POVERTY O. (2). Tall perennials of open woods and meadows, usually in poor soil, the former ranging from Me. to Tenn. and Ohio, the latter throughout the Eastern States and northern Great Plains to the Pacific Coast. Both spp. afford food for wildlife.

Balansia hypoxylon (Pk.) Atk., black choke. Me. to N. Car. and Tenn.; also Ohio and Iowa (1 and 2).
Claviceps purpurea (Fr.) Tul., ergot. Mich. (2)
Epichloë typhina (Pers. ex Fr.) Tul., choke. Md., Va. (2)

Helminthosporium cyclops Drechs., leaf spot. Me., Mass. (2)
Lophodermium danthoniae Tehon, on leaves and sheaths. Ill., Wis. (2)
Phyllachora graminis (Pers. ex Fr.) Fckl., tar spot. Me. (2)
Puccinia graminis Pers. (II), stem rust. W. Va. (2)
Rhynchosporium secalis (Oud.) J. J. Davis, scald. Oreg.
Selenophoma donacis (Pass.) Sprague & A. G. Johns., stem speckle. N. Y. (2)
Ustilago residua Clint., panicle smut. N. Y., N. Car., Tenn., Va. (1); these and also Ind., Iowa, N. H., Vt. (2)

DESCHAMPSIA (GRAMINEAE)

DESCHAMPSIA CAESPITOSA (L.) Beauv., TUFTED HAIRGRASS (1). Tall perennial of moist habitats occurring in the Northeastern and North Central States to the Pacific Coast, including Alaska; a dominant grass in mountain meadows, valuable for forage. D. ATROPURPUREA (Wahl.) Scheele, MOUNTAIN H. (2) grows at higher altitudes in the same range; D. ELONGATA (Hook.) Munro, SLENDER H. (3), is limited to the western part.

Ascochyta graminicola Sacc., leaf spot. Oreg. (3)
Cercospora subulata Sprague, leaf blast. Mont., Wyo. (1)
Claviceps purpurea (Fr.) Tul., ergot. Oreg. (1)
Darluca filum (Biv.-Bern.) Cast., parasitic on rust. Oreg. (3)
Fusarium avenaceum (Fr.) Sacc., parasitic on rust. Oreg. (3)
Hendersonia sp., leaf rot. Oreg. (1)
H. culmicola Sacc. var. minor Sacc., leaf spot. Oreg.
Phaeoseptoria sp., leaf rot. Oreg. (1)
Puccinia coronata Cda. (II,III), crown rust. Oreg., Wash., Wyo. (1)
P. graminis Pers. (II,III), stem rust. Mich., Wash., (1); Calif., Ida., Oreg., Wash. (3); also on (2).
P. poae-sudeticae (West.) Jørst. var. airae (Lagh.) Arth. (P. deschampsiae Arth.) II & III, rust. Colo. (1); Wash. (3). O and I unknown.
Scolecotrichum graminis Fckl., brown stripe. Oreg. (1); Wash. (1 & 2).
Selenophoma donacis (Pass.) Sprague & A. G. Johns., var., stem speckle. Mont., Wyo. (1 & 2); Wash. (3)
Septoria poliomela Syd., tan leaf spot. Oreg., Wash. (1)
Stagonospora graminum Sacc. & Scalia, on leaves. Alaska (2).
S. subseriata Sacc., leaf rot. Oreg.
Tilletia cerebrina Ell. & Ev., bunt. Wash., Wyo. (1); Ida., Oreg. (3)
Uromyces jacksonii Arth. & Fromme (II, III), rust. Calif., Oreg. (1); Ida., Oreg., Wash. (3). O and I unknown.

DESCHAMPSIA DANTHONIOIDES (Trin.) Munro, ANNUAL HAIRGRASS. Annual of western Rocky Mts. and Pacific Coast.

Puccinia graminis Pers. (II, III), stem rust. Calif., Wash.
Scolecotrichum graminis Fckl., brown stripe. Oreg.
Selenophoma donacis (Pass.) Sprague & A. G. Johns. var., stem speckle. Wash.
Septoria poliomela Syd., tan leaf spot. Oreg., Wash.
Tilletia cerebrina Ell & Ev., bunt. Calif., Oreg., Wash.
Uromyces jacksonii Arth. & Fromme (II, III), rust. Calif.

DIGITARIA (GRAMINEAE)

DIGITARIA FILIFORMIS (L.) Koel., SLENDER FINGERGRASS (1). Annual occurring from New England to Fla., Tex. and Iowa. D. SEROTINA (Walt.) Michx., BLANKET CRABGRASS (2) Annual or perennial ranging from N. Car. to Fla. and La. Primarily weeds in old fields and cultivated ground but affording early summer pasturage and food for wildlife.

Piricularia grisea (Cke.) Sacc., leaf spot. Fla. (2).
Puccinia oahuensis Ell. & Ev. (II, III), rust. Fla. (2). O and I unknown.
Ustilago rabenhorstiana Kuehn, head smut. Mo., N. J. (1).

DIGITARIA HORIZONTALIS Willd., JAMAICA CRABGRASS (1). Annual of tropical America and southern border of Gulf Coast States. D. VIOLASCENS Link, PURPLE C. (2). Annual or perennial of tropical America, occasionally in Ark. and Tex., also Hawaii. Primarily weeds.

Fusarium sp., head mold. Tex. (1)
Heterodera marioni (Cornu) Goodey, root knot. Hawaii (2).
Himantia stellifera Johnston, sheath rot. P. R. (1).
Phyllachora paspalicola P. Henn., tar spot. P. R. (1).
Phyllosticta sp., leaf spot. Ky. (2).
Piricularia grisea (Cke) Sacc., leaf spot. P. R. (1)
Puccinia oahuensis Ell. & Ev. (II, III), rust. Hawaii (2).

DIGITARIA ISCHAEMUM (Schreb.) Muhl., SMOOTH CRABGRASS (1), and D. SANGUINALIS (L.) Scop., HAIRY C. (2). Annuals occurring nearly throughout the U. S. at low and medium altitudes, more common in the East and South, especially (1). Troublesome weeds in cultivated ground but also forming solid stands in pastures, especially (2), and sometimes cut for hay.

Colletotrichum graminicolum (Ces.) G. W. Wils., anthracnose. Md., Mich., N. Dak. (2)
Curvularia geniculata (Tracy & Earle) Boed. and C. trifolii (Kauff.) Boed., leaf rot. N. Dak. (2)
Cuscuta arvensis Beyrich, dodder. Md. (2)
Ditylenchus dipsaci (Kuehn) Filip., stem nematode. N. Y. (2)

Erysiphe graminis DC.., powdery mildew. Tex. (2)
Fusarium scirpi (C. R. Lambert & Fautr.) var. acuminatum (Ell. & Ev.) Wr., secondary root rot. N. Dak. (2)
Helminthosporium sp., leaf spot. Minn., Miss. (2)
H. leucostylum Drechs., leaf spot. S. Car. (2)
H. sativum Pam. King & Bakke, on leaves. N. Dak. (2)
Heterodera marioni (Cornu) Goodey, root knot. Md. (1), N. Y., N. Car., Hawaii (2)
Mycosphaerella maydis (Pass.) Lindau, leaf spot. P. R. (2)
Phyllachora graminis (Pers. ex Fr.) Fckl., tar spot. N. Car. (2)
Phyllosticta rogleri Sprague, on leaves. Ida., Iowa. (2)
Piricularia grisea (Cke.) Sacc., leaf spot, blast. General (1 and 2). The fungus usually designated P. oryzae Cav., which appears to be only physiologically distinct, also has been reported on these hosts in the South in the belief that it had spread from rice to crabgrass. On the basis of some work these organisms are held to be pathogenically specialized to their respective hosts.
Pratylenchus pratensis (De Man) Filip., in roots. Ga., Hawaii (2)
Puccinia oahuensis Ell. & Ev. (II, III), rust. Fla., Ga., Tex. (with Darluca filum (Biv.-Bern.) Cast.), Canal Zone, P. R. (2). O and I unknown. Has been recorded as P. substriata Ell. & Barth., P. tubulosa Arth. and P. paspalicola (P. Henn.) Arth.
Rhizoctonia solani Kuehn, brown patch. Ohio (2)
Scolecotrichum graminis Fckl., brown stripe. Va. (2)
Septoria sp., leaf spot. Ala., N. J. (2). Reported as S. graminum Desm., doubtful.
Sphacelotheca diplospora (Ell. & Ev.) Clint., head smut. Miss. (2)
Tilletia pulcherrima Ell. & Gal., covered smut. Miss. (2)
Ustilago rabenhorstiana Kuehn, loose smut. General. (1 and 2).

Mosaic -- Saccharum virus 1 K. M. Sm. (Marmor sacchari Holmes). Fla., Ga., La., Hawaii (2).

DISTICHLIS (GRAMINEAE)

DISTICHLIS SPICATA (L.) Greene, SEASIDE SALTGRASS. Perennial of seacoast habitats from Me. to Fla. and Tex., and especially from Mass. to Md., occasional on the Pacific Coast; furnishes food for wildlife.

Cerebella spartinae Ell. & Ev., on spikelets, perhaps associated with conidial stage of ergot. Miss.
Claviceps purpurea (Fr.) Tul., ergot. Md., Wash.
Endodothella tracyi (Ell. & Ev.) Theiss. & Syd. (Phyllachora tracyi Ell. & Ev.), tar spot. Oreg.
Euryachora aristidae (Schw.) Theiss. & Syd., char spot. Calif., Oreg.
Fusarium heterosporum Nees, on spikelets, perhaps associated with conidial stage of ergot. Wash.

F. oxysporum Schlecht. emend Snyder & Hansen and F. solani (Mart.) App. & Wr. var. martii (App. & Wr.) Wr., secondary root rot. N. Dak.
Helminthosporium halodes Drechs., leaf blotch. N. Y.
Phyllachora diplocarpa Ell. & Ev., tar spot. Calif. Also reported in Colo, Kans., N. Mex., S. Dak. & Tex. but probably on B. stricta.
Physalospora cynodontis Del., on culms. Calif., Miss.
Pratylenchus pratensis (De Man) Filip., in roots. Oreg.
Puccinia aristidae Tracy (II, III), leaf rust. Calif., Del., Me., N. Car., Oreg., Tex., Wash. O and I on many, widely separated spp. of dicotyledons, mostly native plants of no economic importance, but including vegetable and ornamental plants, beet, nasturtium, radish, spinach & others.
Uromyces peckianus Farl. (II, III), leaf rust. Calif., Conn., Mass., N. Y., Wash. Resembles Puccinia aristidae and has similar wide range of aecial hosts.
Ustilago hypodytes (Schlecht.) Fr., stem smut. Calif., Conn., Oreg., Tex., Wash.

DISTICHLIS STRICTA (Torr.) Rydb., INLAND SALTGRASS. Perennial of arid, alkaline soil throughout the Western States; of minor forage value.

Darluca filum (Biv.-Bern.) Cast., parasite on rust. N. Mex.
Endodothella tracyi (Ell. & Ev.) Theiss. & Syd., tar spot. Okla., N. Dak.
Euryachora aristidae (Schw.) Theiss. & Syd., char spot. N. Dak., Oreg., S. Dak., Utah, Tex., Wash.
Fusarium scirpi C. R. Lambert & Fautr. var. acuminatum (Ell. & Ev.) Wr., secondary root rot. N. Dak.
Phyllachora diplocarpa Ell. & Ev., tar spot. Colo., Kans., N. Mex., N. Dak., S. Dak., Tex.
P. pammelii Orton, tar spot. Colo.
Puccinia aristidae Tracy (II, III), leaf rust. Calif., Colo., Kans., Mont., Nev., N. Dak., Oreg., S. Dak., Utah, Wash., Wyo. General from eastern N. & S. Dak. to Calif. & Wash.
P. graminis Pers. (II, III), stem rust. Mont.
Tracylla spartinae (Pk.) Tassi, on culms. Tex.
Ustilago hypodytes (Schlecht.) Fr., stem smut. Ariz., N. Mex., Oreg., Utah, Wash.
Wojnowicia graminis (Mc Alp.) Sacc. & D. Sacc., secondary root rot. N. Dak.
Bends (hairpin) -- cause unknown. N. Dak.

ECHINOCHLOA (GRAMINEAE)

ECHINOCHLOA COLONUM (L.) Link, JUNGLE-RICE. Annual of Old World tropics occurring in sloughs and ditches in the Southeastern and Gulf States to southern Calif.; of minor forage value

but furnishes food for wildlife.

Corticium microsclerotia (Matz) Weber, web blight. Fla., P. R. Technically a nomen nudum and considered by some a synonym of Pellicularia filamentosa (Pat.) Rogers.
Heterodera marioni (Cornu) Goodey, root knot. Calif.
Piricularia grisea (Cke.) Sacc., leaf spot. Tex.
Pratylenchus pratensis (De Man) Filip., in roots. Calif.
Sclerotium hydrophilum Sacc., on leaf sheaths. Ark.
S. oryzae Catt., stem rot. Ark. Sclerotial stage of Leptosphaeria salvinii Catt.
Ustilago sphaerogena Burr., head smut. Tex.

Mosaic, unclassified virus, possibly Saccharum virus 1 K. M. Sm. (Marmor sacchari Holmes). Hawaii, P. R.

ECHINOCHLOA CRUSGALLI (L.) Beauv., BARNYARD GRASS. Coarse annual of moist habitats, fields and wastes throughout the U. S. except the mountains and dry plains; of some forage value and sometimes cut for hay; a weed in cultivated fields. Several botanical vars. have been distinguished: one, E. C. var. FRUMENTACEA (Roxb.) Wight, JAPANESE MILLET, has been exploited as a forage grass and its seed is used for feeding.

Alternaria spp., associated with weevil (Anacentrinus deplanatus Casey) injury and other fungi, resulting in basal stem rot. Minn., N. & S. Dak. (Northern Great Plains).
Brachysporium sp. (? B. flexuosum (Cda.) Sacc.), basal stem rot, as above. Northern Great Plains.
Cercospora echinochloae J. J. Davis, leaf spot. Wis.
C. fusimaculans Atk., leaf spot. Wis.
Colletotrichum graminicolum (Ces.) G. W. Wils., anthracnose. Ga., La., Kans., Miss., Ohio, W. Va., Wis.
Curvularia geniculata (Tracy & Earle) Boed. and C. trifolii (Kauff.) Boed., secondary root rot. N. Dak.
Epicoccum sp., leaf spot. Ky., Mich. Head mold. Oreg.
Fusarium avenaceum (Fr.) Sacc., head mold. Wis.
F. culmorum (W. G. Sm.) Sacc., root and stem rot. Minn., N. Dak. Other spp. associated with root rot or basal stem rot in the Northern Great Plains include F. equiseti (Cda.) Sacc., F. graminearum Schwabe, F. oxysporum (Schlecht.) em. Snyder & Hansen, and F. scirpi Lambert & Fautr. var. acuminatum (Ell. & Ev.) Wr.
Helminthosporium sp., leaf spot. Minn.
H. monoceras Drechs., leaf spot. N. Y.
H. sativum Pam. King & Bakke, root rot. Minn., N. Dak.
Heterodera marioni (Cornu) Goodey, root knot. Ark.
Leptosphaeria occidentalis Ell. & Ev., on dead culms. Kans.
Mycosphaerella crusgalli (Ell. & Kell.) Lindau, on leaves. Kans.
Puccinia flaccida Berk. & Br. (II, III), leaf rust. Wis. to Ill., N. Mex. and Nebr. O and I unknown.

P. graminis Pers. (II, III), stem rust. Iowa.
Pythium aristosporum Vanterpool and P. arrhenomanes Drechs., root browning. N. Dak.
P. debaryanum Hesse, root necrosis. N. Dak.
Rhizoctonia solani Kuehn, secondary root and stem rot. Minn., N. Dak.
Sclerotium hydrophyllum Sacc., on leaf sheaths. Ark.
S. oryzae Catt., stem rot. Ark.
Sphacelotheca diplospora (Ell. & Ev.) Clint., covered smut. Ill.
Tolyposporium bullatum (Schroet.), seed smut. Mass. to N. Car. and S. Dak.; Calif.
Ustilago crusgalli Tracy & Earle, node smut. General, more frequent north and west; also on var. frumentacea in Conn.
U. sphaerogena Burr., loose smut. Widespread, chiefly in the Central and Eastern States, also in Calif.

Dwarf, suspected virus. Tex.
Mosaic, unclassified virus, perhaps Saccharum virus 1 (Marmor sacchari Holmes). Hawaii

ELEOCHARIS (CYPERACEAE)

ELEOCHARIS spp., SPIKE-RUSH. Low, mostly perennial sedges of ponds, marshes, and wet soil, throughout the U. S. and in tropical America. They furnish food for wildlife.

Claviceps nigricans Tul., ergot. On E. calva Torr., Ind.; E. palustris (L.) R. & S., N. & S. Dak., S. Car., Wis., Wyo.; E. rostellata Torr., Mich.
Entyloma parvum J. J. Davis, culm smut. On E. acicularis (L.) R. & S., in Mass. and Wis.
Physoderma heleocharidis (Fckl.) Schroet., brown spot. On E. palustris, in N. Dak. and Wash.
Puccinia eleocharidis Arth. (II, III), rust. On E. palustris and other spp. in the Eastern and Central States to the West Indies. O and I on Eupatorium spp.
P. liberta Kern (II, III), rust. On E. montana (H.B.K.) R.&S. and E. palustris in Calif.; on various spp. in P. R.; O and I unknown.
Uredo incomposita Kern (II), rust. On E. geniculata (L.) R. Br. and other spp. in P. R.
Uromyces eleocharidis Arth. (II,III), rust. On E. palustris, Wis. to Ind., Kans., and N. Dak. O and I unknown.

ELEUSINE (GRAMINEAE)

ELEUSINE INDICA (L.) Gaertn., GOOSEGRASS (1). Coarse annual of tropical Africa, established in tropical America and throughout the Southern States north to southern New England and Iowa; a common weed in the South, but of food value for wildlife. E. CORACANA (L.) Gaertn., AFRICAN MILLET or RAGI (2) is a cultivated form, the seed of which is sometimes used for food.

Colletotrichum graminicolum (Ces.) G. W. Wils., anthracnose. Fla. (1).
Corticium microsclerotia (Matz) Weber, web blight. Fla., P. R. (1)
Helminthosporium cynodontis Marig., leaf spot. Fla. (1)
H. giganteum Heald & Wolf, Zonate eye spot. Fla., Md. (1)
H. leucostylum Drechs., leaf spot. Ala., Kans., Ky., La., Md., Wis. (1)
H. nodulosum (Berk. & Curt.) Sacc., on inflorecences. Miss., S. Car. (1)
H. stenacrum Drechs., on old leaves. Md. (1)
Heterodera marioni (Cornu) Goodey, root knot. Fla. (1 and 2). Hawaii (1)
Pratylenchus pratensis (De Man) Filip., in roots. Hawaii

Mosaic, Saccharum virus 1 (Marmor sacchari Holmes). Hawaii, P. R.

DIVISION OF MYCOLOGY AND DISEASE SURVEY

OBSERVATIONS ON GRASS DISEASES IN KENTUCKY, SEPTEMBER, 1942 TO SEPTEMBER, 1944 AND A PRELIMINARY CHECK LIST

John R. Hardison[1]

This is a second report on the grass diseases observed in Kentucky. Records for this area will be greatly enriched by further collections in uncultivated and wooded locations. Collection of diseases on native grasses has been handicapped by travel restrictions.

The preliminary check list includes the diseases reported for 1942[2] in addition to collections made since that report.

From the observations of diseases on four species of agricultural grasses, namely Poa pratensis, Festuca elatior and the variety arundinacea, Dactylis glomerata, and Bromus inermis, it is possible to evaluate the disease situation on these grasses in Kentucky at least in a preliminary way as follows:

Kentucky Bluegrass, Poa pratensis

Of the several diseases attacking this grass in Kentucky, leaf spot and foot rot caused by Helminthosporium vagans appears to be consistently the most serious disease in lawns and pastures. The disease is present the year around but is most destructive during spring and fall. During 1944, the fungus was active throughout most of the summer. In addition to H. vagans, Helminthosporium sativum has been isolated from leaf spots. These H. sativum isolates have produced a severe foot

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[2] Hardison, John R. Plant Dis. Reptr. 27: 103-108. 1943

rot disease in artificial inoculations, but the relationship of H. sativum to the H. vagans problem has not been fully determined.

Stripe smut, Ustilago striaeformis, is also responsible for heavy damage in lawns and pastures. Stripe smut was severe during the spring and early summer of 1943 in small areas where up to 50% of the plants were found infected. However, no fields showed more than an average of about 10% infected plants when inspected. From late June to September smut was very difficult to find on living leaves. The disease reappeared in late fall in a much milder form. The same general observations were made in 1944 except that the disease appeared to be less serious than in 1943. U. striaeformis has been the only species found in over 550 samples of stripe smut examined from central Kentucky.

Leaf rust, Puccinia poae-sudeticae, causes considerable defoliation in pastures and seed fields. It appears to be present throughout the year on living leaves, especially in shaded corners and fence rows. In 1943 the damage occurred principally during the fall and early winter, but a severe outbreak occurred during the spring and early part of the summer of 1944. P. poae-sudeticae has been the only rust species found on Kentucky bluegrass during the period of these observations.

Powdery mildew, Erysiphe graminis, has not been seen to any extent in open fields. The disease is present in small amounts throughout the year in shaded places and appears in more open areas after midsummer. One small area of bluegrass lawn at Lexington was heavily infected with powdery mildew late in the fall of 1942. These plants showed very poor recovery in the spring of 1943.

Leaf spot, Septoria macropoda var. septulata, occurs during the fall and early part of the winter usually beginning in September. The disease was very mild during 1943 in contrast to the heavy attack during the wet fall of 1942.

The culm rot and leaf-killing associated with Septoria oudemansii was very light during the spring and again late in the fall of 1943. In the spring of 1944 only one pasture was seen where the damage was noticeable, and the affected area was a low site with fairly wet soil. This disease is present most of the year but causes damage primarily during the winter and early spring. It is often seen as necrotic lesions in the region of the leaf collar, resulting in yellowing and finally the death of the leaf. Pycnidia can usually be found on the yellowed or browned leaf blades. The fungus is capable of causing a serious culm rot under favorable conditions as described by Griffith[3]. The disease is checked by hot, dry weather and has not been observed to be serious during the period of 1942-44. Much of the late fall and early spring yellowing of lower leaves can be attributed, at least in part, to this disease.

Certain hybrids of Poa arachnifera x P. pratensis have been remarkable for their resistance to leaf rust, powdery mildew and Helminthosporium leaf spot. It is to be hoped that resistance to all or most of these diseases in P. pratensis will be found by plant selection. The disease resistance in P. arachnifera x P. pratensis hybrids suggests an approach to the problem.

Festuca elatior and F. elatior var. arundinacea

Most of the meadow fescue sown in Kentucky in the past from commercial

[3] Griffith, Robert B. A leaf spot disease of Kentucky bluegrass. Phytopath. 33: 745. 1943.

seed sources has been of the Festuca elatior type. These plantings have given a very poor performance. Stands that looked good the first year often went out by the second or third year. Observations at the experiment station farm at Lexington indicate that most, if not all, of the meadow fescue collections of the ordinary F. elatior type are very susceptible to crown rust, Puccinia coronata, and susceptible to Helminthosporium net blotch, H. dictyoides. Meadow fescue collections of this type are damaged severely by the effects of hot, dry weather in July and August, and because of this injury coupled with severe damage from crown rust, are in a very weakened condition as they go into the winter. Many such plants were rated as good during the fall of 1942 and spring of 1943 before any diseases had been observed on them. However, after heavy outbreaks of leaf net blotch and crown rust and severe damage from high temperatures during the summer of 1943 the inferior nature of such plants was apparent. Most of the plants either failed to survive the winter or were in a very weak condition in the spring of 1944. These observations suggest several plausible explanations for the generally poor adaptation of the ordinary meadow fescue of the F. elatior type and probably explain the poor performances and failures in the past of ordinary meadow fescues in Kentucky.

In contrast nearly all plants of all collections of the tall, robust variety of meadow fescue, Festuca elatior var. arundinacea, were resistant to crown rust and were largely resistant to net blotch. Also, plants of this type exhibited little, if any, damage from hot, dry weather. These observations suggest fundamental reasons for the general success of tall fescue in Kentucky. Piper[4] as early as 1914, published similar observations on crown rust damage and also noted the fact that tall fescue remained almost entirely free from the disease.

A leaf spot caused by Cercospora sp. was observed in the Lexington nursery in 1943 and 1944 on Festuca elatior var. arundinacea, but so far has caused only minor damage.

Crown rust, Puccinia coronata, appeared in late July 1943 and became severe by the early part of August. The fungus apparently does not overwinter in the uredinial stage in central Kentucky, since crown rust was not seen before midsummer. Where heavy infections develop it is the most serious disease of meadow fescue, Festuca elatior. Losses can be prevented by the use of, thus far, crown-rust-resistant plant material of F. elatior var. arundinacea. Crown rust was not observed during 1944 up to September 1.

Net blotch, Helminthosporium dictyoides, is present the year around on infected plants. The disease appears to be favored by high temperatures, and the greatest damage occurs during hot, dry weather when the excessive moisture requirements of the plants result in withering and killing of many leaves. As with crown rust, losses can be prevented by the use of resistant plant material of F. elatior var. arundinacea.

A trace of stem rust, Puccinia graminis, was collected in September 1942, and although it has so far caused only minor damage, it occurred on plants of F. elatior var. arundinacea and may represent a potential threat to strains of this botanical variety of meadow fescue.

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4 Piper, Charles V. Forage plants and their culture. 618 pp. MacMillan Co. New York. 1944.

Another species of meadow fescue that may warrant attention in the forage program is Festuca gigantea. This species has shown agronomic promise and has remained free from disease in the writer's nurseries at Ann Arbor, Michigan and Lexington, Kentucky. In the Lexington nursery the first year's growth of F. gigantea was significantly better than one collection of F. elatior and 2 collections of F. elatior var. arundinacea. In artificial inoculations with crown rust, F. gigantea showed considerable variation in reaction of individual plants, but sufficient resistance to crown rust can be obtained. These preliminary observations suggest that F. gigantea should be considered in the program of developing improved strains or varieties of meadow fescue.

Orchard Grass, Dactylis glomerata

Stripe smut, Ustilago striaeformis, is almost universally present in orchard grass fields in small amounts. Occasionally, fields contain a moderate to high percentage of infected plants that may greatly reduce seed yields. When shown blighted seed heads from smutted plants, orchard grass seed growers recognized these as typical of poorly developed heads that they remembered were associated with certain fields giving poor yields. Some of the growers also recognized the shredded leaves of smutted plants and recalled several instances in their experience of fields devastated by the trouble. It is fairly certain that stripe smut has been and will continue to be a destructive disease in seed fields until resistant plant material is available and grown, or other remedial measures are developed and utilized.

Leaf stripe, Scolecotrichum graminis, is nearly always present in rather severe form in the nurseries at Lexington and was the only disease observed to be generally widespread in moderate to heavy amounts in seed fields. Loss of leaf area killed by this disease undoubtedly reduces seed yields, since defoliation occurs prior to seed maturation.

Stagonospora leaf blotch, S. arenaria, was very serious in the Lexington nurseries during 1943, but only a very light infection was seen in commercial seed fields.

Anthracnose, Colletotrichum graminicolum, caused heavy damage to plants at Lexington in the fall of 1942 and during the spring through June of 1943. Only a trace of infection was found in commercial seed fields. This disease represents a potential, serious threat but apparently has caused very little damage in commercial fields during the period of these observations.

Stem rust, Puccinia graminis, and leaf rust, Uromyces dactylidis, appeared in the Lexington nurseries late in the fall of 1943 and caused heavy damage to certain clonal lines.

Smooth Brome, Bromus inermis

Leaf and stem blotch, Stagonospora bromi, was the most serious disease observed in 1943, resulting in severe defoliation of many collections. Helminthosporium leaf spot, H. bromi, was fairly light in occurrence and severity in 1943, but was rather severe during the early part of the summer of 1944. In addition to climatic adaptation, resistance to both these diseases should be sought in a program for development of smooth brome strains for Kentucky.

Incidence of Ergot.

Ergot, Claviceps purpurea, on all the grass species mentioned above was severe during 1943 in the nurseries at Lexington and much less severe in 1944. During 1943 inspection failed to reveal any ergot infection in several orchard grass seed fields in Oldham County although ergot could could usually be found in scattered plants along adjacent roadsides and in fence corners. The orchard grass for commercial seed is usually cut slightly green and mostly with a binder. Any ergot sclerotia that might develop would most likely be carried off the fields with the bundles. Very little ergot could be found in Kentucky bluegrass fields during either 1943 or 1944. Possibly ergot sclerotia in this grass would be removed in the stripping processes. Very little ergot was seen during either 1943 or 1944 in a plot of tall fescue grown on the experiment station farm for seed increase. Cultivation of meadow fescue for seed in rows might duplicate conditions in spaced plant breeding nurseries where severe ergot infections are common. Also, the shattering nature of meadow fescue may permit ergot sclerotia to fall to the ground before and during harvesting operations, especially if the seed is allowed to become fully mature for combining.

Preliminary Check List

Host Index

Agropyron cristatum (L.) Beauv.
- Ergot, Claviceps purpurea

Agropyron repens (L.) Beauv.
- Brown leaf spot, Septoria nodorum
- Ergot, Claviceps purpurea
- Leaf rust, Puccinia rubigo-vera
- Leaf spot, Helminthosporium tritici-repentis
- Powdery mildew, Erysiphe graminis

Agropyron smithii Rydb.
- Ergot, Claviceps purpurea
- Leaf rust, Puccinia rubigo-vera also with parasite, Darluca filum

Agropyron trichophorum (Link) Rict.
- Ergot, Claviceps purpurea
- Leaf rust, Puccinia rubigo-vera

Agrostis alba L.
- Crown rust, Puccinia coronata
- Leaf stripe, Scolecotrichum graminis
- Stem rust, Puccinia graminis
- Stripe smut, Ustilago striaeformis

Andropogon furcatus Muhl.
- Anthracnose, Colletotrichum graminicolum

Andropogon hallii Hack.
- Anthracnose, Colletotrichum graminicolum

Andropogon scoparius Michx.
- Anthracnose, Colletotrichum graminicolum

Anthoxanthum odoratum L.
- Anthracnose, Colletotrichum graminicolum

Arrhenatherum elatius (L.) Mert. & Koch
- Ergot, Claviceps purpurea
- Head smut, Ustilago avenae (U. perennans)
- Leaf stripe, Scolecotrichum graminis

Bouteloua gracilis (H.B.K.) Lag.
- Leaf spot, Cercospora sp.

Bromus cathartious Vahl
- Leaf and sheath spot, Stagonospora bromi

Bromus inermis Leyss.
Bends, cause undetermined
Ergot, Claviceps purpurea
Leaf spot, Ascochyta graminicola
Leaf spot, Helminthosporium bromi
Leaf spot, Stagonospora bromi

Bromus marginatus Nees
Ergot, Claviceps purpurea
Head smut, Ustilago bullata
Leaf spot, Helminthosporium bromi
Leaf spot, Stagonospora bromi
Stem rust, Puccinia graminis

Bromus secalinus L.
Ergot, Claviceps purpurea
Leaf spot, Helminthosporium bromi

Buchloë dactyloides (Nutt.) Engelm.
Leaf spot, Helminthosporium sp.

Cortaderia selloana (Schult.) Aschers. & Graebn.
Leaf spot, Phoma terrestris

Dactylis glomerata L.
Anthracnose, Colletotrichum graminicolum
Bends, cause undetermined
Ergot, Claviceps purpurea
Purple leaf spot, Stagonospora arenaria
Leaf stripe, Scolecotrichum graminis
Leaf rust, Uromyces dactylidis with rust parasite, Darluca filum
Powdery mildew, Erysiphe graminis
Stem rust, Puccinia graminis
Stripe smut, Ustilago striaeformis

Danthonia compressa Austin
Head smut, Ustilago residua

Danthonia spicata (L.) Beauv.
Purple choke disease, Balansia hypoxylon

Digitaria sanguinalis (L.) Scop.
Head smut, Ustilago rabenhorstiana
Leaf spot, Piricularia grisea

Digitaria violascens Link
Leaf spot, Phyllosticta sp.

Echinochloa crus-galli (L.) Beauv.
Anthracnose, Colletotrichum graminicolum
Leaf spot, Epicoccum sp.

Eleusine indica (L.) Gaertn.
Leaf spot, Helminthosporium leucostylum

Elymus canadensis L.
Leaf rust, Puccinia rubigo-vera with rust parasite Darluca filum
Leaf spot, Stagonospora arenaria
Stripe smut, Ustilago striaeformis

Elymus virginicus L.
Choke (cat tail fungus), Epichloë typhina
Leaf rust, Puccinia rubigo-vera
Leaf stripe, Scolecotrichum graminis
Stripe smut, Urocystis agropyri
Stripe smut, Ustilago striaeformis
Tar spot, Phyllachora graminis

Eragrostis cilianensis (All.) Link
Leaf spot, Helminthosporium restratum

Festuca elatior L.
Anthracnose, Colletotrichum graminicolum
Bends, cause undetermined
Crown rust, Puccinia coronata
Ergot, Claviceps purpurea
Leaf net blotch, Helminthosporium dictyoides
Leaf spot, Epicoccum sp.
Stem rust, Puccinia graminis

Festuca elatior var. arundinacea (Schreb.) Wimm.
Bends, cause undetermined
Crown rust, Puccinia coronata
Ergot, Claviceps purpurea
Leaf blotch, Helminthosporium dictyoides
Leaf spot, Epicoccum sp.
Leaf spot, Cerospora sp.
Stem rust, Puccinia graminis

Festuca rubra var. commutata Gand.
Ergot, Claviceps purpurea

Glyceria striata (Nash) Hitchc.
Brown leaf spot, Septoria nodorum plus Ascochyta phase.

Lolium multiflorum Lam.
Crown rust, Puccinia coronata
Ergot, Claviceps purpurea
Leaf spot, Helminthosporium siccans

Lolium perenne L.
Crown rust, Puccinia coronata

Muhlenbergia schreberi Gmel.
Leaf rust, Puccinia schedonnardi

Panicum dichotomiflorum Michx.
Head smut, Ustilago panici-proliferi

Paspalum pubescens Muhl.
Leaf rust, Puccinia substriata, with rust parasite, Darluca filum

Phalaris arundinacea L.
Leaf spot, Ascochyta graminicola

Phleum pratense L.
Bends, cause undetermined
Leaf spot. Heterosporium phlei
Leaf stripe, Scolecotrichum graminis
Stem rust, Puccinia graminis
Stripe smut, Ustilago striaeformis

Poa chapmaniana Scribn.
Stripe smut, Ustilago striaeformis

Poa compressa L.
Leaf stripe, Scolecotrichum graminis

Poa palustris L.
Silver top, Fusarium poae

Poa pratensis L.
Anthracnose, Colletotrichum graminicolum
Bends, cause undetermined
Drought spots and fairy rings, Marasmius oreades
Ergot, Claviceps purpurea
Leaf eyespot and foot rot, Helminthosporium vagans
Leaf rot, Fusarium sp.
Leaf spot and foot rot, Helminthosporium sativum
Leaf spot and culm rot, Septoria oudemansii
Leaf spot, Ascochyta graminicola
Leaf spot, Septoria macropoda var. septulata
Leaf rust, Puccinia poae-sudeticae with and without rust parasite, Darluca filum
Powdery mildew, Erysiphe graminis
Stripe smut, Ustilago striaeformis

Setaria lutescens (Weigel) F. T. Hubb
Leaf spot, Helminthosporium sativum
Leaf spot, Cercospora setariae
Leaf spot, Piricularia grisea

Triodia flava (L.) Smyth
Leaf spot, Stagonospora paspali

Disease and Pathogen Index

CAUSE UNDETERMINED

Bends.
Bromus inermis
Dactylis glomerata
Festuca elatior
Festuca elatior var. arundinacea
Phleum pratense
Poa pratensis

ASCOMYCETES

Balansia hypoxylon (Pk.) Atk.
Danthonia spicata

Claviceps purpurea (Fr.) Tul.
Agropyron cristatum
Agropyron repens
Agropyron smithii
Agropyron trichophorum
Arrhenatherum elatius
Bromus inermis
Bromus marginatus
Bromus secalinus
Dactylis glomerata
Festuca elatior
Festuca elatior var. arundinacea
Festuca rubra var. commutata
Lolium multiflorum
Poa pratensis

Epichloë typhina (Pers. ex Fr.) Tul.
Elymus virginicus

Erysiphe graminis DC.
Agropyron repens
Dactylis glomerata
Poa pratensis

Phyllachora graminis (Pers. ex Fr.) Fckl.
Elymus virginicus

FUNGI IMPERFECTI

Ascochyta graminicola Sacc.
Bromus inermis
Phalaris arundinacea
Poa pratensis

Cercospora setariae Atk.
Setaria lutescens

Cercospora sp.
Bouteloua gracilis
Festuca elatior var. arundinacea

Colletotrichum graminicolum (Ces.) G. W. Wils.
Andropogon furcatus
Andropogon hallii
Andropogon scoparius
Anthoxanthum odoratum
Dactylis glomerata
Echinochloa crus-galli
Festuca elatior
Poa pratensis

Darluca filum (Biv.-Bern.) Cast.
With Puccinia poae-sudeticae on:
Poa pratensis
With Puccinia rubigo-vera on:
Agropyron smithii
Elymus canadensis
With Puccinia substriata on:
Paspalum pubescens
With Uromyces dactylidis on:
Dactylis glomerata

Epicoccum sp.
Echinochloa crus-galli
Festuca elatior and var. arundinacea

Fusarium poae (Pk.) Wr.
Poa palustris

Fusarium sp.
Poa pratensis

Helminthosporium bromi Died.
Bromus inermis
Bromus marginatus
Bromus secalinus

Helminthosporium dictyoides Drechs.
Festuca elatior
Festuca elatior var. arundinacea

Helminthosporium leucostylum Drechs.
Eleusine indica

Helminthosporium rostratum Drechs.
Eragrostis cilianensis

Helminthosporium sativum Pam. King & Bakke
Poa pratensis
Setaria lutescens

Helminthosporium siccans Drechs.
Lolium multiflorum

Helminthosporium tritici-repentis Died.
Agropyron repens

Helminthosporium vagans Drechs.
Poa pratensis

Helminthosporium sp.
Buchloë dactyloides

Heterosporium phlei Greg.
Phleum pratense

Phoma (terrestris Hansen ?)
Cortaderia selloana

Phyllosticta sp.
Digitaria violascens

Piricularia grisea (Cke.) Sacc.
Digitaria sanguinalis
Setaria lutescens

Scolecotrichum graminis Fckl.
Agrostis alba
Arrhenatherum elatius
Dactylis glomerata
Elymus virginicus
Phleum pratense
Poa compressa

Septoria macropoda var. septulata (Gonz. Frag.) Sprague
Poa pratensis

Septoria nodorum Berk.
Agropyron repens
Glyceria striata

Septoria oudemansii Sacc.
Poa pratensis

Stagonospora arenaria Sacc.
Dactylis glomerata
Elymus canadensis

Stagonospora bromi A. L. Sm. & Ramsb.
Bromus catharticus
Bromus inermis
Bromus marginatus

Stagonospora paspali Atk.
Triodia flava

USTILAGINALES

Urocystis agropyri (Preuss) Schroet.
Elmyus virginicus

Ustilago avenae [5] (Pers.) Rostr.
Arrhenatherum elatius

Ustilago bullata[6] Berk.
Bromus marginatus

Ustilago panici-proliferi P. Henn.
Panicum dichotomiflorum

Ustilago rabenhorstiana Kuehn
Digitaria sanguinalis

Ustilago residua Clint.
Danthonia compressa

Ustilago striaeformis (West.) Niessl
Agrostis alba
Dactylis glomerata
Elymus canadensis
Elymus virginicus
Phleum pratense
Poa chapmaniana
Poa pratensis

UREDINALES

Puccinia coronata Cda.
Agrostis alba
Festuca elatior
Festuca elatior var. arundinacea
Lolium multiflorum
Lolium perenne

Puccinia graminis Pers.
Agrostis alba
Bromus marginatus
Dactylis glomerata
Festuca elatior
Festuca elatior var. arundinacea
Phleum pratense

Puccinia poae-sudeticae (West.) Jørst.
Poa pratensis

Puccinia rubigo-vera (DC.) Wint.
Agropyron repens
Agropyron smithii
Agropyron trichophorum
Elymus canadensis
Elymus virginicus

[5] According to the concept of Dr. George W. Fischer, Mycologia 35: 611-613. 1943

[6] Ibid. 29: 408-425. 1937

Puccinia schedonnardi Kell. & Swing.
Muhlenbergia schreberi

Puccinia substriata Ell. & Barth.
Paspalum pubescens

Uromyces dactylidis Otth.
Dactylis glomerata

AGARICALES

Marasmius oreades Fr.
Poa pratensis

DIVISION OF FORAGE CROPS AND DISEASES

ERGOT OF DALLIS GRASS IN CALIFORNIA

W. W. Mackie and W. C. Snyder

Although the ergot disease of Dallis grass, Paspalum dilatatum Poir., is well known in the Southern States and in New Zealand and Australia, what was thought to be the first specimen of this disease to be observed in California was picked up at the edge of a rice field in San Joaquin County about December 1, 1944, well after the beginning of the rainy season. This specimen contained both numerous sclerotia of the fungus, Claviceps paspali Stevens & Hall, and also the conidial or "honey-dew" stage, on the infected head.

On December 7 the writers, accompanied by Dr. H. N. Hansen, visited the Riverbank and Escalon areas in Stanislaus and San Joaquin Counties and observed ergot commonly on the heads of Dallis grass in those places where the plant had established itself in and about ditches bordering rice fields. The heads were quite sticky with the conidial stage and fully developed sclerotia were plentiful. In many cases the heads were partially blackened by the growth of various secondary green molds including Cladosporium, growing on the "honey-dew."

During the same month specimens of the disease were received from Fresno County, through Miss Margaret K. Bellue of the State Department of Agriculture.

It is thought probable that the disease has been present in California for many years. Professor B. A. Madson has informed the writers that he observed ergot on Paspalum 20 years ago in a planting in Merced County made with Texas seed.

The presence of the ergot disease of Paspalum in California is looked upon with some concern because of the value of this plant in pastures in certain areas in the San Joaquin Valley, where its planting has been encouraged, and because of the toxic effect of the sclerotia upon livestock. It is believed possible that some of the unexplained poisoning of livestock in these areas may have resulted from feeding by the animals on ergot-infected heads.

Since ergot diseases are commonly distributed by means of sclerotia carried along with the seed, seed sources of Dallis grass perhaps should be considered from the disease standpoint, particularly where new areas are to be planted to Paspalum.

DIVISIONS OF AGRONOMY AND PLANT PATHOLOGY, UNIVERSITY OF CALIFORNIA AT BERKELEY.

MOSAIC OF WHEAT IN THE CAROLINAS[1]

R. E. Atkinson

Wheat mosaic, was found for the first time in South Carolina in the wheat variety test plots at Clemson in the spring of 1944. The symptoms were similar to those of wheat mosaic virus No. 5 of McKinney[2]. Mosaic was present on 2 rye varieties planted but was not found on any of the 18 barley varieties. It was not found on any subspecies of Hordeum deficiens, H. distichon, H. intermedium, or H. vulgare.

The mosaic was later found in North Carolina in counties in which it had been reported in the 20's. It was also found on rye in Granville County, North Carolina.

The following list shows the varieties of wheat and rye in the test at Clemson and the presence or absence of mosaic.

Reaction of Wheat and Rye Varieties to Mosaic at Clemson, S.C.
(+ = mosaic present; - = no mosaic)

Variety	Mosaic	Variety	Mosaic
1. Tennessee No. 2	-	13. Carala	+
2. H 1050-12-5-10-3	-	14. Hardired Strain 3	-
3. Forward No. 257	-	15. Sanett	-
4. Redhart Strain 5	+	16. Sanett 41-12-24	-
5. Hardired Strain 42-3	+	17. Carala N. 231	+
6. V.P.I. No. 305	-	18. Hardired Strain 4	+
7. Hardired Strain 42-11	+	19. Fulcaster Strain 612	-
8. Tennessee 64-25-88	-	20. Sanford	-
9. Hardired No. 201	+	21. Hardired Strain 42-16	-
10. Clemson Purplestraw	+	22. Wood's Abruzzi rye	+
11. Leap's Prolific No. 104	-	23. Wood's winter rye	+
12. Hardired No. 21	+		

EMERGENCY PLANT DISEASE PREVENTION PROJECT

A NEW MOSAIC CHLOROSIS OF OATS IN THE CAROLINAS[1]

R. E. Atkinson

A chlorosis of oats having a mosaic pattern similar to the wheat and sugarcane mosaics and other virus-induced chloroses was first observed by Dr. G. A. Armstrong and the author in March 1944 in South Carolina. Several head rows of oat selections in a varietal test at Hartsville showed this characteristic mottling, and material from one selection of Avena x 1095-1-3 (Coker 32-1) sent to Dr. Leland Shanor was referred to Dr. H. H. McKinney of the Division of Cereal Crops and Diseases who stated that the condition was like mosaic. Subsequently the disease was

[1] The writer was accompanied by Dr. G. M. Armstrong on surveys in South Carolina and by Dr. S. G. Lehman in North Carolina.
[2] McKinney, H. H. USDA Circ. 442. 1-22. 1937.

[1] Dr. S. G. Lehman accompanied the author on the survey in North Carolina

found in varietal test plots at Clemson, and at Westminister. Mosaic of wheat apparently due to wheat virus No. 5 of McKinney[2], was also present in the wheat variety trials at Clemson and on two varieties of rye.

Distribution. In the course of the Emergency Plant Disease Prevention Program the chlorosis was observed throughout both States. The counties in which the disease was found in farmers' fields are indicated in Fig. 1. The general distribution of this disease in the Carolinas would indicate that it may be present in adjacent States.

Symptoms. The mottling appears most conspicuously on the rapidly developing new leaves in spring. It appears as more or less regular streaks of varying width and length but always following the long axis of the leaf and usually 10 or more times long as wide. The streaks are not light-green as in mild mosaic, nor yellow as in severe mosaic of sugarcane, but almost cream color. They have a somewhat whitish cast like that which develops in wheat mosaic. The mottling is not confined to the blades, but also appears on the sheaths. It is often best seen at the basal part of the leaf blade. In addition to the mottling the disease causes a stunting or dwarfing which is very striking and probably the most conspicuous symptom at heading time, especially when diseased and disease-free varieties are planted side by side. The excessive stunting and failure to head that characterizes "rosette" was not observed, but in some varieties a rolling of the leaves produces an appearance similar to the "wild-garlic-like" leaves found in wheat rosette.

At heading time it is common to find plants in some varieties with the lower leaves mottled while the upper leaves are healthy. The plants give every indication that they have recovered from the disease. This "growing-out" or disappearance of the mosaic has been observed in certain sugarcane varieties[3].

Varietal Reaction. In Table 1 the varieties of oats grown in the test plots at Clemson are listed and the presence or absence of the mosaic chlorosis is indicated. The reaction of these varieties was the same in other test fields except that in some locations one or two plants in other varieties might be also affected. Because this could be due to varietal impurity it was not recorded. At Hartsville and Westminister, South Carolina, and Statesville, North Carolina this disease was present in the varietal tests, but nowhere was the amount of infection so high or so uniform as at Clemson.

In addition to the varieties listed the disease was present in Lelate, Lelina, Lega, and Kanota varieties at Westminister. Both common winter and Red types are affected.

The presence or absence of mosaic chlorosis in various species of Avena grown at Clemson is shown in Table 2.

Dr. McKinney, with Dr. T. R. Stanton of the U. S. Division of Cereal Crops and Diseases visted the locations at Hartsville, Clemson, and Statesville, where the mosaic chlorosis had been found in varietal tests, and subsequently the former started experiments to determine the true

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[2] McKinney, H. H. U.S.D.A. Circ. 442. 1-22. 1937.

[3] Forbes, I. L., and P. J. Mills. Disappearance of virus from mosaic diseased sugarcane plants. Phytopath. 33: 713-718. 1943.

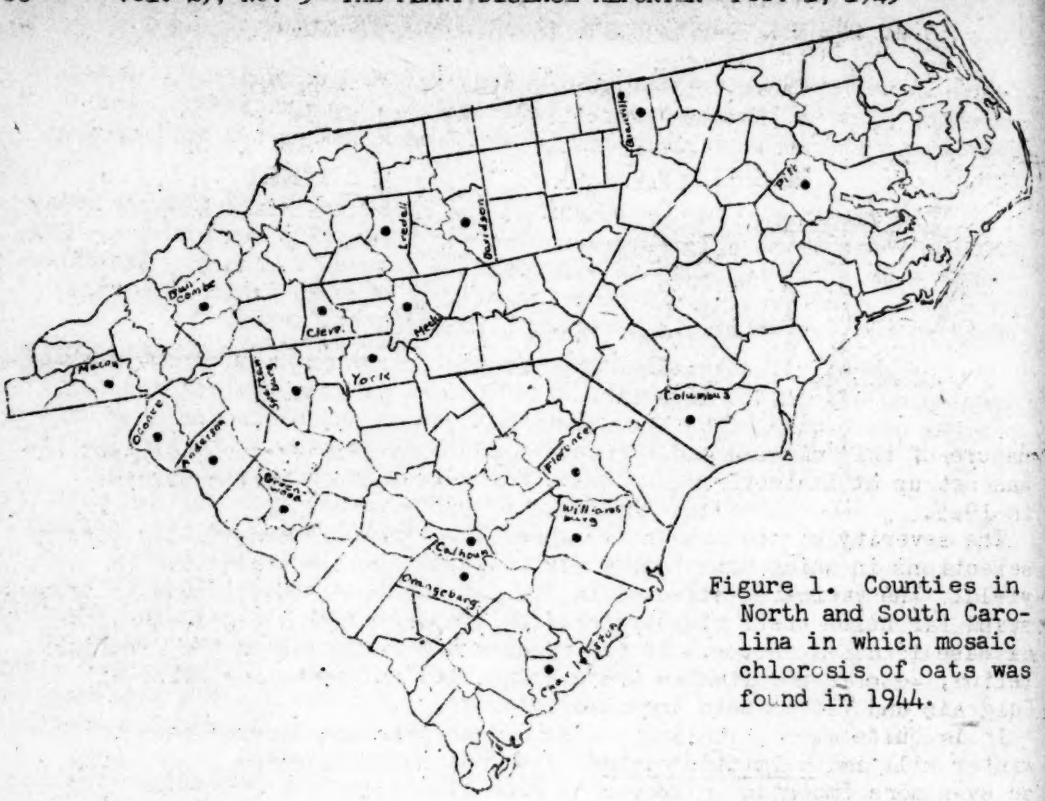

Figure 1. Counties in North and South Carolina in which mosaic chlorosis of oats was found in 1944.

Table 1. Reaction of Oat Varieties to Mosaic Chlorosis at Clemson, S. C.

	Variety	Reaction		Variety	Reaction
1.	Hasting's 100-Bushel	+	14.	Fulwin	-
2.	Marett's Carolina Red	+	15.	Coker's Stanton Strain 43-33	+
3.	Marett's Marmac	+	16.	Coker's Hybrid Strain 43-53	+
4.	Marett's Red Oats	+	17.	" Victorgrain " 4	-
5.	Coker's Victorgrain Strain 43-1	-	18.	" " " 43-3	+
6.	Marett's Winter Resistant Strain 3		19.	Marett's Fulghum	+
7.	Marett's Winter Resistant Strain 5	-	20.	Coker's Victorgrain Strain 43-11	-
8.	Coker's Victorgrain Strain 43-5	-	21.	Coker's Stanton Strain 2	+
9.	Coker's Fulgrain Strain 6	-	22.	Wood's Victorgrain No. 182	-
10.	Clemson Fulghum	+	23.	Coker's Fulgrain Strain 43-14	+
11.	Forked Deer	-	24.	Coker's Victorgrain Strain 43-12	-
12.	Wood's Lee	+	25.	Coker's Stanton Strain 43-45	+
13.	Letoria	+	26.	Wood's Fulgrain No. 304	-

Table 2. Reaction of Species of Avena to Mosaic Chlorosis at Clemson, S. C.

Species	Reaction
1. Avena fatua	-
2. A. abyssinica	+
3. A. barbata	=
4. A. brevis	-
5. A. wiestii	=
6. A. strigosa	+
7. A. nudibrevis	+

nature of this disease and a cooperative federal-state varietal test was set up at Statesville, to test varietal reaction to the disease in 1945.

The severity of the disease is especially great in genetically pure selections in which the trouble may cause 50% or more reduction in yield. The varieties affected in yield tests where the disease is present stand far below their yield records in comparison with tests where the disease is not a factor. Of the recommended varieties in the Carolinas, Lelina, Letoria and Stanton are all attacked and certain strains of Fulgrain and Victorgrain are also affected.

It is quite evident that the mosaic chlorosis predisposes oats to winter kill and Helminthosporium foot rot, and this phase is probably an even more important source of loss.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

ADDITIONAL HOSTS OF DIAPORTHE SOJAE

E. S. Luttrell

During 1943 and 1944 at several localities in Georgia Diaporthe sojae Lehman was observed upon 4 different crop plants, namely, soybean, cowpea, snap bean, and lima bean. D. sojae was originally described as the cause of a pod and stem blight of soybean (Ann. Mo. Bot. Gard. 10:111-178, 1923), and there have since been frequent reports of its occurrence upon this host in various parts of the United States. It has also been reported previously on cowpea (PDR. 28 (3):81, Feb. 1, 1944) and on peanut (PDR. 28(36):1096, Nov. 7, 1944) in Virginia. Snap bean and lima bean, however, apparently represent new hosts for D. sojae. The following field observations of its occurrence on these hosts in Georgia have been made.

Snap Bean. Pycnidia of D. sojae were abundant on dead stems and dried pods of various hybrid snap beans at the time of harvesting for seed in fields at both Tifton (July) and Experiment (August) in 1943. In the same fields in 1944 only scattered plants were infected. D. sojae was almost constantly associated with Macrophomina phaseoli (Maubl.) Ashby with which it might be confused upon superficial examination. Infection of the pedicels of plants of the Tendergreen variety was general in a field at Tifton in June 1944. Approximately 40% of these plants, which

otherwise were healthy and still bearing, showed such infection. Infected pedicels were generally those from which pods had been picked or on which the pods had been destroyed by insects. Infection of leaves was observed only twice. D. sojae was also isolated from the hypocotyls of beans killed apparently by root rot. Fusarium spp. and M. phaseoli were associated with it on these plants.

Lima bean. During the fall of 1943 D. sojae was found fruiting upon the upper branches of a few dead, matured plants of Henderson bush lima bean at Experiment and also on a farm 3 miles south of Griffin. Pycnidia were not present upon the dried pods on infected branches, but the seeds inside were infected and shriveled. M. phaseoli was present upon the bases and lower branches of these plants. D. sojae was found more abundantly upon dead branches of pole lima beans at Experiment during the 1944 growing season. Associated with it were Colletotrichum sp. and Sphaeropsis sp. The fungus on lima bean appears to be identical with D. sojae on soybean and to differ from D. phaseolorum (Cke. & Ell.) Sacc., the cause of pod blight of lima bean.

Cowpea. A few stem infections of dead cowpeas were observed at Experiment in the fall of 1943. In August 1944 D. sojae was found fruiting abundantly upon dead stems and dried pods of cowpeas in a field near Arabe. It was associated there with M. phaseoli. In the fall there were again scattered infections of dead stems and pods of a number of varieties at Experiment. The fungus destroyed and fruited upon seed in old cracked pods left hanging upon the dead plants.

Soybean. A number of infections with D. sojae were found in a variety planting of soybeans at Experiment in the fall of 1943. Boone, the earliest variety represented, was the most severely infected. Approximately 70% of the dead stems of mature plants of this variety bore pycnidia of D. sojae. In the same field in 1944 infection was negligible. D. sojae was observed also on weakened lower branches, petioles, and pods of soybean plants earlier in the season. Colletotrichum glycines Hori also was usually present on these plants.

There was little evidence that D. sojae is strongly pathogenic on any of the 4 crop plants on which it was found. It occurred chiefly on senescent or weakened plants and was almost constantly associated with other pathogenic fungi. From the observations which have been made upon it, D. sojae seems at the most to be only a weak parasite.

GEORGIA EXPERIMENT STATION, EXPERIMENT, GEORGIA

STORAGE DISEASES OF FRUITS AND VEGETABLES IN NEW YORK

Robert C. Cassell

APPLES. During the first 2 weeks of January, 15 lots of apples representing 5,750 bushels were examined in 2 cold storage plants, one in Webster and one in Fairport (Monroe County). In most cases the apples were orchard-run, stored in bushel baskets or boxes. Only 2 lots had been grade packed.

McIntosh:- Eight of the 15 lots were McIntosh and represented 4,243 bushels of the apples examined. Orchard scab (Venturia inaequalis) was the most prevalent disease encountered. Scab was present in 7 of

the 8 lots. Prevalence ranged from 30 to 85% with an average of 46.5% for the 7 lots. Severity averaged light to moderate.

Storage scab was present in 5 of the 8 lots of McIntosh. Prevalence ranged from a trace to 82% with an average prevalence of 22% for the 5 lots. Severity was light in all cases.

Blue mold rot (Penicillium expansum) was present in 6 of the 8 lots. Prevalence ranged from a trace to 25% with an average of 7.5% for the 6 lots. Severity was light in all cases.

Gray mold rot (Botrytis spp.) was found in 3 of the 8 lots. Prevalence ranged from 2 to 10% with an average of 5.7% for the 3 lots. Severity was light.

Black rot (Physalospora obtusa) was found in only one lot, but the prevalence was about 15% and the severity light to moderate.

Alternaria rot (Alternaria sp.) was found in 2 of the 8 lots. Only a trace was present in one case and about 2% in the other. Severity was very light in both cases.

Bitter pit (physiogenic) was found in only one lot. However severity was heavy on about 5% of the fruits.

Hail damage was present in 3 of the 8 lots. Average prevalence for the 3 lots was 47.0% and the severity moderate to heavy.

Other Varieties. The remaining 7 lots consisting of 1,507 bushels was made up of one lot each of Baldwin, Wolf River, and Northern Spy; and 2 lots each of Cortland and Rhode Island Greening. Orchard scab was present in 6 of the 7 lots. Prevalence ranged from a trace to 50% with an average of 28.5%. Severity averaged light.

Storage scab was present in 4 of the lots with an average prevalence of 15%. In only one lot was the severity more than a trace. In the Baldwins, storage scab was moderately severe on 40% of the fruits.

Blue mold rot was present in 3 of the lots with an average prevalence of 6.5%. Only trace to light infections were found.

Gray mold rot was found only in the Cortlands. About 2% of the fruits were affected.

Alternaria rot was also found in the Cortlands, but as a trace only.

Bitter pit was present in 3 of the 7 lots with an average prevalence of 35%. It was particularly severe in Baldwin (55% prevalence, severity moderate to heavy), and Wolf River (45% prevalence, severity light to moderate).

Common scald (physiogenic) was present in one lot of Rhode Island Greening. Prevalence was about 5%.

Hail damage was present in 5 of the 7 lots. Average prevalence was about 30% and the severity averaged moderate.

PEARS. Three small lots of pears ranging from 10 to 35 bushels each were seen in the Webster, Fairport and Marion cold storages. There were 2 lots of Seckel and one of Bosc. In the Bosc, blue mold rot (Penicillium expansum) was present on about 30% of the fruits. Gray mold rot (Botrytis sp.) was also present on about 30%, and scab (Venturia pyrina) was found on about 5% although the severity of scab was very light. In one lot of Seckel, blue mold appeared on about 8% of the fruits, and gray mold on about 4%. In the other lot of Seckel the only disease present appeared under microscopic examination to be sooty blotch (Gloeodes pomigena), occurring as moderate to heavy infection on about 15% of the fruit.

CARROTS. Three cold storages and two common storages containing nearly 145,500 bushels of carrots were visited in Geneva, Webster, Marion and Fairport. In general it may be stated that most vegetables, including carrots, are keeping exceedingly well in the northern New York storages this year. Harvesting was done under dry cool field conditions, and in the absence of any severe early frosts. The winter season has been cold which has helped the common storage operators to maintain favorable temperatures in their houses. As a result very little storage trouble has developed to date.

Watery soft rot (Sclerotinia sclerotiorum) was the predominant rot in the Fairport cold storage. However the prevalence could only be considered a trace. Seven hundred and fifty-three crates were examined critically while a car of carrots was loaded for shipment. Only 6 bushel boxes contained any rot. This was all watery soft rot and amounted to about 25% affected carrots in the 6 boxes. Further examination of the 92,000 bushel Fairport storage revealed the presence of a trace of black rot (Alternaria radicina) [Stemphylium radicinum] and possibly a mere trace of gray mold rot (Botrytis spp.)

In the Webster cold storage of 31,000 bushels only a trace of gray mold rot was found. In the Fairport common storage of 7,500 bushels a trace of what appeared to be mixed watery soft rot and gray mold rot was found. There was also a slight trace of black rot present in this storage. In the Geneva common storage of 10,000 bushels, black rot was found in amounts of more than a trace and less than 1%. In the Marion cold storage of some 5,000 bushels only a trace of gray mold rot was found.

CELERY. A little less than 500 crates of celery have been examined in 4 cold storages. Most of the celery has already been removed from storage. In the Fairport storage one grower had brought in 50 crates of Pascal celery that had been frozen in the field before harvest. This particular lot suffered at least a 30% loss by freezing injury and soft rot bacteria. Another lot of 30 crates of Pascal suffered a 5-10% loss from gray mold rot (Botrytis spp.).

In the Savannah cold storage one lot of 16 crates of Pascal was a 50% loss because of field frost and soft rot bacteria. Another lot of 150 crates of Pascal was 100% affected and 40% seriously affected with late blight, small-spot form, (Septoria apii).

In the Marion cold storage scattered but small amounts of gray mold rot and bacterial soft rot (Erwinia carotovora) were found in a 20 crate lot of blanched celery. In the Newark cold storage of a 5-crate lot of blanched celery was a 5% loss because of black crown rot (Ansatospora macrospora).

BEETS. A large beet cannery was visited at Raymond where considerable trouble was caused by dry rot (boron deficiency). Some lots brought in by different growers were running as high as 40 and 50% dry rot, which amounted to considerable expense and loss from the canning standpoint. The cannery officials reported that dry rot was worse this year in the Raymond area than it had been for the last 4 or 5 years. Less than 1% rot was also occurring in the cannery common storage, caused by Fusarium spp., Rhizopus spp., and bacteria. There were at least 4 species of Fusarium involved, the most prevalent being of the F. culmorum type.

In the Savannah common storage no disease appeared to be present except about 1 to 2% scab (Actinomyces scabies). A trace of Fusarium rot (Fusarium spp.) was also found in a common storage in Fairport.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

STUDIES ON THE CONTROL OF ONION SMUT BY SEED TREATMENTS IN OREGON

P. W. Miller and F. P. McWhorter

The value of Thiosan, Arasan, and Fermate dusts for controlling onion smut (Urocystis cepulae) under New York and Indiana conditions has recently been discussed by Newhall (PDR 28: 881-882 1944), and by Gregory (PDR 28: 965-966. 1944)

During 1943 and 1944 these and other dusts were tested in Oregon under both field and greenhouse conditions. Two or more greenhouse trials of Thiosan, Arasan, Fermate, New Improved Ceresan, 2% Ceresan dusts, and of formalin solution were made at rates specified in Table 1. The treated seeds were planted in randomized replicated rows in a greenhouse bench in naturally infested peat soil. This peat soil was brought in from the Lake Labish area, a typical onion-growing locality where smut occurs every year. A summary of these tests is given in Table 1. As several kinds of onion seeds treated at different times were used in these tests, averaging of the data is not permissible.

Table 1.-- Results of greenhouse studies on the control of onion smut by seed treatments, Corvallis, Oreg., 1943-1944.

Treatment	Rate	Average[a] percent of "smutted" seedlings in test:				
		1	2	3	4	5
		Treated seeds from A. G. Newhall[b]		Locally treated seeds		
Thiosan	100% by weight	1.3	28.2	50.3	15.8	---
Thiosan	75% by weight	12.7	21.3	---	---	---
Arasan	100% by weight	---	14.3	---	---	67.9
Arasan	75% by weight	---	15.3	---	---	66.2
Fermate	100% by weight	15.2	21.2	---	20.8	72.7
Fermate	75% by weight	16.5	16.7	---	---	73.6
New Improved Ceresan	100% by weight	---	---	47.0	11.6	---
2% Ceresan	100% by weight	---	---	64.5	13.0	---
Formaldehyde solution 1-100 by volume	15cc per ft. of row	3.0	10.5	5.6	4.0	16.0
Not treated		32.1	62.3	57.3	27.2	73.6

[a] Average of 5 randomized replicates of 100 seeds per test.

[b] National cooperative seed treatment tests.

It is apparent from the data given in Table 1 that under these conditions none of the dust treatments used was consistently so effective as the standard treatment with formaldehyde solution but some of them were significantly effective in certain of the tests.

In addition to greenhouse tests, one field trial was made in 1943 in the Lake Labish onion-growing district near Salem, Oregon. The treatments used in this test were Arasan, Fermate, and calomel. In each case the fungicide was mixed with an equal amount of seed by weight and the mixture planted with a hand planter in 150-foot rows. There were 6 replications of each treatment. The effect of each of these treatments on the percentage of "smutted" seedlings is given in Table 2.

Table 2.--Results of field studies on the control of onion smut. Lake Labish center, Oreg., 1943

Material	Rates of application	Average[a] percent of "smutted" seedlings
Arasan	100% by weight	48.1
Fermate	100% by weight	67.5
Calomel	100% by weight	87.6
Formaldehyde solution	1 pt. to 16 gal. water; 125 gals. per acre	34.2[b]
None	----------	66.9

[a] Average percent of "smutted" seedlings in twelve 5-linear-foot units selected at random in 6 treated rows.

[b] Average of two 5-foot units.

It is evident from the data given in Table 2 that under these field conditions none of the dusts used gave satisfactory control of smut. It is probable that the erratic results obtained in our greenhouse and field tests are functions of both the adhesive and fungicidal properties of the dusts. The addition of a sticking agent to the dusts would likely increase their effectiveness against smut and also increase the difficulty of drilling the seed. In our field trials, Fermate, the most adhesive of these dusts, "clogged" up the seeder and gave uneven stands. Dr. Newhall's suggestion[1] to treat the seeds first with a suitable adhesive and then dust them just before planting seems advisable for further trials. Such a procedure may avoid the difficulties encountered in drilling and provide a sufficient mass of fungicide on the seeds to protect against smut in our heavily infested soil. It is planned to conduct such tests in Oregon during the coming season.

DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES
BUREAU OF PLANT INDUSTRY, SOILS AND AGRICULTURAL ENGINEERING, AGRICULTURAL RESEARCH ADMINISTRATION, AND OREGON AGRICULTURAL EXPERIMENT STATION

[1] As per typed directions sent to certain County Agents in New York State, a copy of which was forwarded to us.

ISOLATIONS OF VERTICILLIUM FROM TREES AND SHRUBS IN ILLINOIS, 1940-1944

J. C. Carter

The writer reported in 1938[1] and again in 1940[2] the woody hosts from which he had isolated Verticillium albo-atrum Reinke & Berth. in Illinois. In 1941, 1942, and 1943 he isolated this fungus from wilting redbud (Cercis canadensis L.), in 1942 from a wilting trumpet vine (Campsis radicans (L.) Seem.), and in 1944 from a wilting Amur privet (Ligustrum amurense Carr.). These and additional isolations of Verticillium obtained from 1940 to 1944 from trees and shrubs in Illinois are listed in Table 1 according to host and location.

During 1943, Verticillium was obtained from only one out of one hundred samples of diseased woody plants. This is the smallest number of Verticillium isolations to have been obtained from diseased trees and shrubs in our laboratory in any one year.

Two isolations, one from Persimmon and one from Sassafras, were not characteristic V. albo-atrum. They differed in not producing black microsclerotia or mycelium and in having much smaller spores.

Table 1.--Some hosts of Verticillium and their location in Illinois, obtained from 1940 to 1944.

Host	County	Town	Number of plants infected 1940	1941	1942	1943	1944
Acer platanoides L. (Norway maple)	DuPage	Hinsdale			1		
	Kane	St. Charles		1			
	Morgan	Concord			1		
	Winnebago	Rockford		1			
Acer saccharum Marsh. (Hard maple)	DuPage	Hinsdale	1	1			
	Wayne	Wayne City	1				
Berberis Thunbergii D. C. (Japanese barberry)	Champaign	Champaign				1	
Campsis radicans (L.) Seem. (Trumpet vine)	Pulaski	Olmsted			1		
Cercis canadensis L. (Redbud)	Champaign	Champaign		1			
	DuPage	Elmhurst				1	
	Lawrence	Lawrenceville			1		
Diospyros virginiana L. (Persimmon)	Pulaski	Grand Chain	1*				

[1] Carter, J. C. Verticillium wilt of woody plants in Illinois. U. S. Dept. Agric. Plant Dis. Rptr. 22(12):253-254. 1938.

[2] Carter, J. C. Some isolations of Verticillium in Illinois during 1938 and 1939. U. S. Dept. Agric. Plant Dis. Rptr. 24(6):133-134. 1940

Host	County	Town	Number of plants infected 1940	1941	1942	1943	1944
Ligustrum amurense Carr. (Amur privet)	Cook	Techny				1	
Rhus glabra L. (Smooth sumac)	Champaign	Urbana		1			
	Henderson	Rozetta			1		
	LaSalle	Ottawa		1			
	Winnebago	Rockford		1			
Sassafras albidum (Nutt.) Nees. (Sassafras)	Edwards	West Salem	1*				
Ulmus americana L. (American elm)	Champaign	Champaign		1	1		
	Cook	Chicago		1			
	DeWitt	Clinton			1		
	DuPage	Hinsdale	2	4	2		
		Elmhurst			1		
	Kane	St. Charles		1			
Viburnum sp.	Champaign	Champaign		1			

* The species of Verticillium unidentified. All other isolations were V. albo-atrum Reinke & Berth.

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